

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1 1. (Currently amended) A drainage system, which comprises:

2 (a) a stack having opposed ends ~~an inlet and an~~
3 ~~outlet~~;

4 (b) a branch pipe connected to the stack at a
5 point spaced between the ends ~~inlet and the outlet~~ of the
6 stack ~~having a drain opening with a vent opening spaced~~
7 ~~between the stack and the drain opening, and~~

8 (c) a fixture connected to the branch pipe;

9 ~~(c)~~ (d) a relief vent connected to the branch pipe
10 at a point between the stack and the fixture and the vent
11 opening in fluid communication with the branch pipe,
12 wherein the relief vent is configured so that when gas
13 enters one end ~~the inlet~~ of the stack and creates positive
14 pressure in the branch pipe, the relief vent opens to allow
15 gas in the branch pipe to escape from the drainage system
16 through the relief vent into air outside of and surrounding
17 the relief vent so as to equalize pressure in the drainage
18 system.

1 2. (Currently amended) The drainage system of Claim 1
2 wherein the relief vent has opposed ends ~~an inlet and an~~
3 ~~outlet~~ with a flexible valve member spaced therebetween,
4 wherein when positive pressure exists in the branch pipe
5 adjacent one end ~~the inlet~~ of the relief vent, the valve
6 member moves to an open position to form a passageway
7 between the ends of the relief vent to allow gas to escape
8 into air surrounding the relief vent ~~inlet and the outlet.~~

1 3. (Currently amended) The drainage system of Claim 2
2 wherein the valve member has a first end and a second end,
3 wherein the relief vent is positioned so that the first end
4 of the valve member is adjacent ~~the vent opening of~~ the
5 branch pipe and wherein in a normal position, the second
6 end of the valve member is closed.

1 4. (Currently amended) The drainage system of Claim 2
2 wherein the valve member has a first end and a second end
3 with a flexible sidewall extending therebetween forming an
4 inner passageway, wherein the first end of the valve member
5 is adjacent ~~the vent opening of~~ the branch pipe, wherein in
6 a normal position, the inner passageway of the valve member
7 tapers in cross-section from the first end toward the
8 second end and the flexible sidewall adjacent the second

9 end of the valve member is curled, wherein when gas is
10 introduced into the inner passageway of the valve member at
11 the first end, the flexible sidewall uncurls and the inner
12 passageway of the valve member expands adjacent the second
13 end such as to allow the gas to exit the valve member
14 through the second end of the valve member and wherein the
15 gas exiting the valve member reduces pressure in the branch
16 pipe ~~and prevents the fluid from exiting the branch pipe~~
17 ~~through the drain opening.~~

Claims 5-6 (Cancelled)

1 7. (Currently amended) The drainage system of Claim 1
2 wherein ~~the branch pipe has a second vent opening, wherein~~
3 an air admittance valve is connected to the branch pipe at
4 a point between the stack and the fixture ~~the second vent~~
5 ~~opening~~ and wherein the air admittance valve opens in
6 response to negative pressure in the branch pipe adjacent
7 the air admittance valve so that ~~fluid~~ gas is able to enter
8 the branch pipe through the air admittance valve to
9 equalize pressure in the branch pipe.

1 8. (Currently amended) The drainage system of Claim 1
2 wherein an air admittance valve is connected to the branch
3 pipe at the point between the stack and the fixture where
4 the relief vent is connected ~~the vent opening~~ and wherein
5 the air admittance valve opens in response to negative
6 pressure in the branch pipe to allow gas ~~fluid~~ to enter the
7 branch pipe through the air admittance valve to equalize
8 the pressure in the branch pipe.

1 9. (Original) The drainage system of Claim 1 wherein the
2 stack has a height of at least 480 inches (12191 mm).

1 10. (Currently amended) A drainage system, which comprises:

2 (a) a stack having opposed ends ~~an inlet and an~~
3 ~~outlet~~;

4 (b) a branch pipe in fluid communication with
5 the stack and connected to the stack between the ends
6 ~~inlet and the outlet~~ of the stack, ~~the branch pipe having~~
7 ~~a drain opening~~;

8 (c) a fixture connected to the branch pipe;

9 ~~(c)~~ (d) a relief vent in fluid communication with
10 the branch pipe and connected to the branch pipe at a point
11 between the fixture ~~drain opening~~ and the stack and
12 configured to open in response to positive pressure in the

13 branch pipe to reduce positive ~~equalize~~ pressure in the
14 branch pipe; and
15 ~~(d)~~ (e) an air admittance valve in fluid
16 communication with the branch pipe and connected to the
17 branch pipe at the point between the fixture drain opening
18 and the stack where the relief vent is connected and
19 configured to open in response to negative pressure in the
20 branch pipe to reduce negative ~~equalize~~ pressure in the
21 branch pipe.

1 11. (Currently amended) The drainage system of Claim 10
2 wherein the relief vent and the air admittance valve are
3 connected to the branch drain pipe by a connector pipe at
4 ~~a common point~~.

12. Cancelled

1 13. (Currently amended) The drainage system of Claim 10
2 wherein the relief vent has opposed ends ~~an inlet and an~~
3 ~~outlet~~ with a flexible vent member spaced therebetween,
4 wherein when positive pressure exists in the branch pipe
5 adjacent one end ~~the inlet~~ of the relief vent, the flexible
6 vent member moves to an open position to form a passageway
7 between the ends of the relief vent ~~inlet and the outlet~~.

1 14. (Currently amended) The drainage system of Claim 13
2 wherein the flexible vent member has a first end and a
3 second end, wherein the relief vent is positioned so that
4 the first end of the flexible vent member is adjacent the
5 branch pipe and wherein in a normal position, the second
6 end of the flexible vent member is closed.

1 15. (Currently amended) The drainage system of Claim 13
2 wherein the flexible vent member has a first end and a
3 second end with a flexible sidewall extending therebetween
4 forming an inner passageway, wherein the first end of the
5 flexible vent member is adjacent the branch pipe, wherein
6 in a normal position, the inner passageway of the flexible
7 vent member tapers in cross-section from the first end
8 toward the second end and the flexible sidewall adjacent
9 the second end of the flexible vent member is curled,
10 wherein when gas is introduced into the inner passageway of
11 the flexible member at the first end, the flexible sidewall
12 uncurls and the inner passageway of the flexible vent
13 member expands adjacent the second end such as to allow the
14 gas to exit the flexible vent member through the second end
15 of the flexible vent member and wherein the gas exiting the
16 flexible vent member reduces the positive pressure in the

17 branch pipe ~~and prevents fluid from exiting the branch pipe~~
18 ~~through the drain opening.~~

Claims 16 -17 (Cancelled)

1 18. (Original) The drainage system of Claim 10 wherein the
2 stack has a height of at least 480 inches (12192 mm).

1 19. (Withdrawn) A method for equalizing pressure in a
2 drainage system, the drainage system having a stack having
3 an inlet and an outlet with a branch pipe in fluid
4 communication with the stack connected to the stack between
5 the inlet and the outlet, the branch pipe having a drain
6 opening, the method which comprises the steps of:

7 (a) providing a relief vent connected to the
8 branch pipe at a point spaced between the stack and the
9 drain opening;

10 (b) providing fluid into the inlet of the stack
11 so that the fluid moves past the branch pipe and moves into
12 the branch pipe;

13 (c) opening the relief vent in response to
14 positive pressure in the branch pipe adjacent the relief
15 vent; and

16 (d) evacuating gas in the branch pipe through

17 the relief vent until pressure in the pipe valve is
18 equalized.

1 20. (Withdrawn) The method of Claim 19 wherein further in
2 step (d), after pressure in the branch pipe is equalized,
3 the relief vent closes.

1 21. (Withdrawn) The method of Claim 19 wherein the stack
2 adjacent the outlet has a bend, wherein in step (b), the
3 bend prevents gas in the stack from moving out of the
4 outlet of the stack and wherein the gas trapped in the
5 stack moves to the branch pipe and in step (d), the trapped
6 gas is exhausted through the relief vent.

1 22. (Withdrawn) The method of Claim 19 wherein the relief
2 vent has an inlet and an outlet with a flexible vent member
3 spaced therebetween and forming a passageway, wherein the
4 flexible member has a flexible sidewall, wherein in a
5 normal position, the flexible sidewall adjacent the outlet
6 of the relief vent is curled toward the inlet of the relief
7 vent and wherein in step (c), when pressure in the branch
8 pipe reaches a certain level, the sidewall uncurls and the
9 passageway opens to allow the gas in the branch pipe to
10 escape to equalize the pressure in the branch pipe.

1 23. (Withdrawn) The method of Claim 19 wherein in step (b),
2 the liquid is provided into the stack by a high velocity
3 pump, wherein a speed of the liquid moving through the
4 stack traps gas along a length of the stack, wherein the
5 trapped gas moves into the branch pipe and wherein in step
6 (d), the trapped gas escapes through the relief vent.

1 24. (Withdrawn) The method of Claim 19 wherein an air
2 admittance valve is provided in the branch pipe and wherein
3 in step (b), as liquid moves down the stack past the branch
4 pipe, a velocity of the liquid determines if positive or
5 negative pressure is produced in the branch pipe, wherein
6 if positive pressure is created in step (b), the gas
7 trapped in the branch pipe opens the relief vent to allow
8 the trapped gas to escape and wherein if negative pressure
9 is created in step (b), the negative pressure opens the air
10 admittance valve and enables air to enter the branch pipe
11 to equalize the pressure.

1 25. (New) The drainage system of Claim 11 wherein the
2 connector pipe is a Y-connector.

1 26. (New) The drainage system of Claim 8 wherein the
2 relief vent and the air admittance valve are connected to
3 the branch pipe by a connector pipe.

1 27. (New) The drainage system of Claim 26 wherein the
2 connector pipe is a Y-connector.